REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From - To)*
10-05-2007	FINAL	

4. TITLE AND SUBTITLE

Rethinking Military Planning Processes: An Integrated Approach to Traditional, Effects-Based, and Systemic Design Methods

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

David W. Abba, Major, USAF

Paper Advisor (if Any): Professor Doug Hime

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Joint Military Operations Department
Naval War College
686 Cushing Road
Newport, RI 02841-1207

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

Distribution Statement A: Approved for public release; Distribution is unlimited.

13. SUPPLEMENTARY NOTES A paper submitted to the faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.

14. ABSTRACT

Traditional planning processes, Effects-Based Operations, and Systemic Operational Design fill niches in the continuum of military planning, yet each is insufficient by itself to generate optimum solutions to every problem. This paper first describes three systemic problems faced by every modern planning process. With these issues in mind, this paper then examines the strengths and weaknesses of each planning process. Finally, a recommended integrated planning process is proposed that leverages the strengths of each process while mitigating their weaknesses.

15. SUBJECT TERMS

Military Planning, Operational Planning, Effects-Based Operations (EBO), Systemic Operational Design (SOD)

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Chairman, JMO Dept
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED		30	19b. TELEPHONE NUMBER *(include area code)* 401-841-3556

Standard Form 298 (Rev. 8-98)

NAVAL WAR COLLEGE
Newport, R.I.

RETHINKING MILITARY PLANNING PROCESSES: AN INTEGRATED APPROACH TO TRADITIONAL, EFFECTS-BASED, AND SYSTEMIC DESIGN METHODS

by

David W. Abba

Major, United States Air Force

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature: //signed-dwa-10 May 07//

10 May 2007

Contents

Introduction 1

Definitions and Assumptions 2

Gaps in Current Planning Processes 2

The Strengths and Weaknesses of Each Approach 4

- Traditional Processes 5
- Effects-Based Operations 8
- Systemic Operational Design 11

The Way Ahead: An Integrated Approach 14

Conclusion 17

Appendix A: Traditional Processes 21

Appendix B: Effects-Based Operations 22

Appendix C: Systemic Operational Design 23

Selected Bibliography 25

Abstract

Traditional planning processes, Effects-Based Operations, and Systemic Operational Design fill niches in the continuum of military planning, yet each is insufficient by itself to generate optimum solutions to every problem. This paper first describes three systemic problems faced by every modern planning process. With these issues in mind, this paper then examines the strengths and weaknesses of each planning process. Finally, a recommended integrated planning process is proposed that leverages the strengths of each process while mitigating their weaknesses.

RETHINKING MILITARY PLANNING PROCESSES: AN INTEGRATED APPROACH TO TRADITIONAL, EFFECTS-BASED, AND SYSTEMIC DESIGN METHODS

In preparing for battle I have always found that plans are useless, but planning is indispensable.
- General Dwight D. Eisenhower

The military planning process needs an overhaul. Charting the best way forward for its continued evolution requires leveraging the strengths of traditional processes, Effects-Based Operations (EBO), and Systemic Operational Design (SOD) to mitigate the weaknesses of each. Each of these processes fills a niche in the continuum of military decision making, yet no single process by itself is sufficient to generate an optimum solution to every problem. While recent written contributions to the debate have succeeded in poking holes in individual processes, few have succeeded in finding common ground among these disparate yet complementary ideas.

Adopting a modified planning process will not be easy. The modified process must accommodate a vast range of scenarios. It must be flexible enough to deal with contingency operations across the range of military operations. It must span the spectrum from theoretical, conceptual notions and discourse to actionable operational products. This change must also be evolutionary, not revolutionary, to give the process a chance to survive intellectual debate and to be usable and useful during its maturation. Discarding years of valuable planning experience would be a recipe for disaster.

In order to chart the way ahead, this paper first establishes definitions and assumptions essential to ensuring common ground for discussion. Second, the essence of the planning problem is described in more detail. Third, the strengths and weaknesses of each planning process are identified and analyzed. Finally, a recommendation for an integrated process is proposed.

DEFINITIONS AND ASSUMPTIONS

Each of the three processes discussed in this paper attack decision making, problem solving, and planning from different perspectives. For the purposes of this paper, each process is labeled a "planning process" despite differences in purpose and intent.

The second definition that must be established is what to call the overarching design of a campaign or major operation. Tremendous ambiguity exists across the services and the joint community about this term.[1] For the purposes of this paper, "operational concept" from Joint Publication 5-0 will be used to represent the output of operational design (from SOD), strategy (from Air Force Doctrine Document [AFDD] 2, *Operations and Organization*), and the operational idea or scheme (from Navy Warfare Publication 5-01, *Navy Planning*).

The *Commander's Handbook for an Effects-Based Approach to Joint Operations* is the most current and authoritative, but pre-doctrinal, joint publication that addresses effects. This document discusses the integration of effects in joint planning, but AFDD 2 provides a much more succinct and theoretical description of effects-based concepts. Therefore, most references to effects-based theory in this paper are to AFDD 2. Additionally, for the purpose of simplicity, EBO and the effects-based approach will be synonymous.

This paper assumes the reader has a working knowledge of traditional planning processes (such as the Military Decision Making Process [MDMP] or the Navy Planning Process [NPP]), and some awareness of EBO and SOD. For a brief synopsis of each concept, see Appendices A, B, and C.

GAPS IN CURENT PLANNING PROCESSES

Analysis of the current planning environment reveals some gaps in current planning processes. The gaps described are not the only problems facing the planning community, but

they are three significant problems that exist independent of specific processes. Examining these problems in isolation before identifying the strengths and weaknesses of each process demonstrates the scope of the planning problem in its entirety.

The first gap is that current processes do not cover the spectrum from problem setting through problem solving. Traditional planning processes are problem-solving methodologies and are not designed to accommodate problem setting. Problem solving occurs when subordinates translate higher headquarters' mission statements and directives into an actionable operational plan or order. Problem solving is solution oriented; the process is geared toward understanding the operational environment and providing a solution that satisfies the commander's guidance and intent. According to John F. Schmitt of the Marine Corps Warfighting Laboratory, problem setting, on the other hand, is "locating, identifying and formulating the problem, its underlying causes, structure and operative dynamics."[2] Effective problem setting may provide planners greater insight into the dynamics of the strategic environment that caused the problem in the first place, which should result in a plan that has a better chance of achieving the desired strategic end state.

Second, many recent operations, from Defense Support to Civil Authority after Hurricane Katrina, to the ongoing nation building in Operations IRAQI FREEDOM and ENDURING FREEDOM, demand unprecedented levels of interagency coordination and synchronization of all instruments of national power (diplomatic, informational, military, and economic). Current planning processes are insufficient in this area, particularly since the Department of Defense (DoD) is not always the lead federal agency, despite having the most robust planning capability. Military planners must be prepared to build plans that incorporate all instruments of national power while understanding the military's inability to direct

compliance from other agencies. Building plans without adequate coordination may lead to the development of courses of action that conflict with other instruments of power.

Third, planning in the modern world requires addressing wicked problems that result from an increasingly nuanced and complicated world order.[3] The dissolution of the bipolar Cold War structure has facilitated and enabled the rise of a wide array of threats. Rogue states which may have been controllable under the Cold War paradigm have more strategic freedom of action. Non-state actors present unique problem sets in the international arena. Globalization has complicated the relationships between states as well as increased the complexity of interactions between and among a state's government, military, social structure, and the institutions that facilitate governance. These wicked problems require planners to view friendly, neutral, and enemy actors as systems. Conventional mission analysis techniques are not optimized to provide insight into the enemy as a system, making a holistic understanding of the enemy, and the factors that determine its strategic interests, difficult to achieve. Systemic knowledge also facilitates greater understanding of the linkages between objectives at the strategic, operational, and tactical levels of war.

THE STRENGTHS AND WEAKNESSES OF EACH APPROACH

Examining the strengths and weaknesses of each process either in use or under consideration within DoD adds depth to the problem set described above. The strengths identified here form the core capabilities and methodologies that will be combined to form the recommended holistic, end-to-end problem identification and solving process. The weaknesses identified here are not necessarily negatives. They are merely gaps that exemplify or reinforce the presence of the problems described above. Again, this list is not exhaustive, but presents the three most salient strengths and weaknesses of each process.

Traditional Processes

The first strength of traditional planning processes is their staying power and refined problem-solving methodologies. Every service of the United States military has used some version of the traditional process for at least the last fifty years. Decades of employing the same process led to refinement of the process. When commanders and planners are presented with a higher headquarters' mission statement via a warning order, traditional processes excel at providing a military solution to a military problem. This is especially true at the functional or service component level because components build plans that support Joint Task Force (JTF) or higher level objectives. The analytical nature of traditional processes is therefore appropriate to reduce the problem into its most basic pieces. By the end of mission analysis, members of the joint planning group (JPG) or operational planning team (OPT) are experts in the assigned problem, assigned mission, commander's intent, and each side's center of gravity (COG).

A second strength is the value added by wargaming each proposed friendly course of action (COA) against the enemy's most dangerous and most likely COAs. Dedicated red cells, versed in the enemy's interests, capabilities, and decision-making methodologies, help identify gaps in blue COAs before proposed solutions are offered to the commander. Limited planning time generally limits the time available for COA analysis, but even hasty wargaming provides valuable insights into strengths and weaknesses of blue COAs. Wargaming also identifies decision points to the commander that may require transition to branch or sequel plans.

A third strength of traditional processes is their similarity to most services' tactical planning processes and procedures. Each service, except the U.S. Air Force and U.S. Navy

tactical aviation, plans tactically using similar procedures to its six or seven-step operational planning process.[4] This allows planners to leverage tactical planning experience when serving on JPGs or OPTs.

The first weakness of traditional processes is that they are not focused on framing problems. Planners at the JTF level must first understand whether a problem exists, the cause of the problem, and the nature of the problem before pursuing solutions to the problem. This requires a holistic understanding of the strategic environment in which the problem exists and not just the traditional mission analysis that leads to COA development. Limited or poor understanding of the strategic interactions between friendly, neutral, and enemy actors may lead to solving a problem, but not its root cause or even solving the wrong problem. The problem passed as a mission statement in a warning order may be a symptom of an even larger problem. If so, solving the obvious problem risks aggravating the higher-order problem and making the strategic situation worse. According to Schmitt, "experienced decision makers focus their efforts on understanding the situation rather than generating courses of action."[5] Traditional processes are not structured in this manner. The more complex the problem, the less likely it is to conform to our previous experience. Complex operational problems therefore warrant more time in problem framing than problem solving.

The second weakness of traditional processes is the reliance on analysis over intuition. Each higher echelon of command faces more situational ambiguity, and planning must focus more on deciphering and dealing with ambiguity than reducing a problem into its component pieces. Traditional processes excel at breaking down problems analytically, but are lacking in the design of an operational concept which requires intuition. According to Schmitt, "doctrine… lists 'elements of operational design,' but nowhere does doctrine

describe the design *process* or how to perform it. Some commanders historically have designed effectively, while many others have designed poorly or not at all. When commanders have designed, it has usually been idiosyncratically and implicitly rather than as an explicit, structured process."[6] Schmitt's position is seconded by U.S. Army Colonel Chris Paparone, who writes, "one danger in MDMP is being over analytical, creating a tendency toward premature closure in the process of formulating stratagems. Decision makers may be more comfortable or competent conducting MDMP's procedural aspects. They may give inadequate attention to the less-structured, but more important, step of generating stratagems in the first place."[7]

The third problem that plagues traditional processes is the potential for process and product primacy. This weakness may manifest itself in any decision making process, but the linear, product-oriented nature of traditional processes makes them more susceptible to this problem. While procedures are built into traditional processes to ensure they are iterative in certain areas, these processes are designed to operate in a linear fashion. If sufficient time exists, as may be the case in contingency planning, earlier steps in the planning process can be revisited. Military members tend to be creatures of habit and structure, and do not instinctively want to revisit and refine work that has already been "completed." This element of human behavior is difficult to influence and may resist all measures short of directing iteration in a planning process. Completing steps in the process and providing required deliverables can lead planners to feel that they are building a good plan merely by progressing through the process. Excessive focus on attractive deliverables may limit the time planners have to build and refine their plan. Worse, a cleverly built PowerPoint brief can make a bad analysis or plan look good.

Effects-Based Operations (EBO)

The first strength of EBO is it provides the first formalized process for examining problems using a holistic, systemic lens. Systemic thinking acknowledges the complex interactions between systems that exist within a system. Examining the system holistically enables the pursuit of achieving causality in those systems. This is the conceptual foundation of EBO. According to Lieutenant General David Deptula, "at its heart is the exploration of *control*—creating the necessary effects so that an adversary operates in accordance with our national security objectives."[8] Understanding the complex relationships among an adversary's political, military, economic, social, infrastructure, and information (PMESII) domains using node-and-link analysis informs COA development in ways not usually seen in traditional processes. Nodal analysis provides insights into converging decisive points which, if cascading effects are achieved, may accelerate the achievement of objectives.

Second, because EBO sees the world holistically, it naturally encourages COAs that are more inclusive of all instruments of national power.[9] Achieving effects against and within PMESII systems is not limited to direct kinetic attack. In some scenarios, the use of force may be counterproductive to generating the effects required to support achievement of objectives. While EBO does not promise to solve the problem of interagency coordination and synchronization, it does encourage planners to consider using other instruments of power as a means of striking the enemy in parallel. As AFDD 2 notes, "experience has shown that parallel, asymmetric operations are more effective, achieve results faster, and are less costly than symmetric or serial operations."[10]

The third strength of EBO is it effectively bridges a gap that sometimes exists between objectives and tasks. Some objectives dictated by higher authority are not

necessarily conducive to the development of supporting effects. For example, if tasked to destroy an object, the tactical objective or result is easy to measure and quantify, provided the object is observable. Other tasks, and their accompanying actions, may not be so simple. By first defining objectives, and then defining effects, EBO takes into consideration a wider array of consequences of accomplishing a specific task or action. As Figure 1 shows, actions create both direct and indirect effects. One component of indirect effects is unintended indirect effects. For some scenarios, unintended effects may be just as important as intended effects when developing COAs or assigning tasks to subordinate units. Thus, defining effects does not "sever the link" between objectives and tasks, or "[weaken] the importance of objectives in the decisionmaking and planning process."[11] Defining effects helps ensure that tasks are designed to both achieve the intended effects and avoid unintended effects.

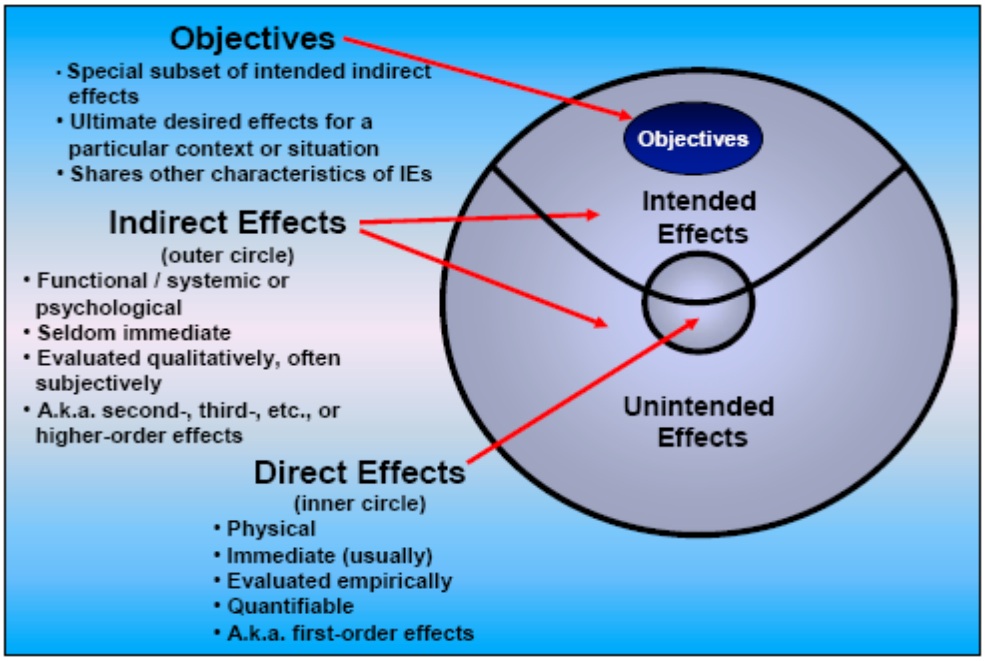

Figure 1. Basic Types of Effects (AFDD 2, pg 87)

The first weakness of EBO is its means of visualizing systems complexity and interaction. The nodes and links identified during a system-of-systems analysis (SoSA)

provide a visual representation of PMESII elements. One problem with the SoSA model is that an effective model of a system must strike a balance between the fidelity of the model and its utility. Building an effective model requires making it complex enough to ensure it sufficiently mirrors reality to meet the needs of the user. This is an asymptotical problem; adding more components to a model increases the fidelity, but since the model is only a model, it will never completely match reality. At some point, adding additional components will pass the point of diminishing returns, making the model too complex to be useful. Modeling the interaction of systems can also lead to a false sense of security about the relative degree of knowledge about an adversary. As Dr. Tim Challans writes, "in other words, we reify entities in the framework (nodes, actions, effects, etc.) on the basis that we know something about them when in fact they will not exist in the real world in the manner in which we have assigned them ontological status. The whole framework as a representation is a lot closer to what we think we know than what exists in the real world, thereby giving us more comfortable illusions than real knowledge."[12]

The second weakness of EBO, at least as proposed in the *Commander's Handbook for an Effects-Based Approach to Joint Operations*, is using SoSA to identify enemy COGs. If the validity and utility of the model is always suspect due to its natural inability to represent reality, then COGs derived from node-and-link analysis may be the result of false inductive reasoning. Construction of each leg of the PMESII model requires both analysis of each independent system and its interaction with other systems. The complexity of the model requires eliminating some nodes and links in order to make the model useful. Therefore, the COG may be derived from an incomplete, but apparently holistic, model of the enemy. Incorrect identification of the enemy COG is a fatal flaw in an operational plan

because the COG is, by definition, "the characteristics, capabilities, and/or sources of power from which a system derives its freedom of action, physical strength, and will to fight."[13]

The third weakness of EBO is predicting and producing causality in the human domain. If "conflict is a clash of complex, intelligent systems that adapt as they interact,"[14] these systems are comprised of, and led by, human beings. Enemy functional systems such as an Integrated Air Defense System (IADS) are conducive to modeling and predictive analysis of how the system will respond to inputs. Modeling and predicting human behavior is a much more difficult proposition. Here again Dr. Challans provides insight into the nature of this problem, saying, "the deep assumption here is that people can be caused to behave, and modifying behavior is simply a matter of adjusting input to get a different output. Action theory recognizes that the mental realm falls outside the normal physical realm of cause and effect. One simply cannot cause another person to act a certain way; people act for reasons, not causes."[15] Unless a human being's options are reduced to a limited number of potential responses to a specific stimulus, it is nearly impossible to predict how that human will respond. We can make a man hungry, but that does not necessarily mean we will cause him to eat when we think he should or will, provided he has other options available to him.

Systemic Operational Design (SOD)[16]

The first strength of SOD is that it counteracts the first weakness described in the traditional process -- it recognizes the fundamental importance of framing the problem at hand. Not only does SOD seek to frame the problem, it also provides a means for the stakeholders to reach a common understanding about the problem. According to Schmitt, "from a social perspective, discourse is a way to allow the various stakeholders to have their

positions heard and recognized. It facilitates appreciating and reconciling different views among the stakeholders. Importantly, discourse is not only about reaching a solution, but also about building social commitment to the solution."[17] The first part of this statement is critical not only to framing the problem, but also bounding it as well. This helps ensure that the commander is addressing the root cause of the problem, and not just a symptom of it. Figure 2 shows where SOD fits within the continuum of planning.

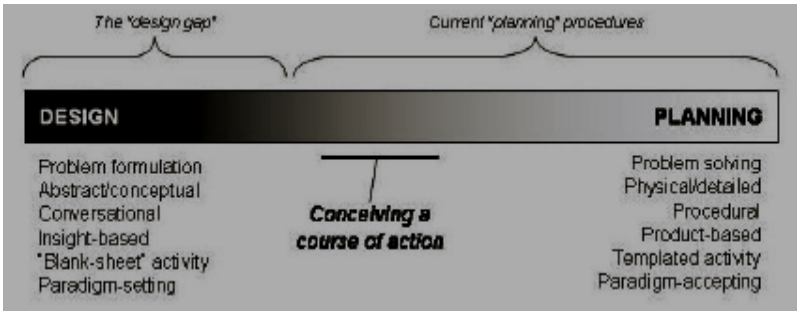

Figure 2. The Design-Planning Continuum (Schmitt, pg 7)

The second strength of SOD is that it recognizes the value of using intuition to generate a single operational concept. According to Schmitt, "the underlying premise of this concept is that if we understand a problem well enough, a solution to the problem becomes self-evident."[18] Traditional planning processes typically require planning teams to build multiple COAs for analysis, comparison, and finally a decision by the commander. SOD essentially trades time in COA development and comparison for time spent in discourse, at least at the JTF level. Subordinate planners may still need to develop multiple COAs to achieve component objectives and fulfill stated mission requirements. A potential pitfall of traditional planning processes is that separate proposed COAs may be solving different problems rather than providing different means of solving the same problem. Leveraging the intuitive understanding of the problem and solution developed during discourse allows planners to use the time typically spent developing multiple COAs to refine the one solution.

The third strength of SOD is the benefit of seeking a holistic systems understanding at the strategic level. As described in the analysis of EBO, attempting to develop an operational systems view without a corresponding strategic framework can lead planners down the wrong solution path. Using SOD techniques to comprehend the strategic environment and the interests of all actors can be used to inform and focus mission analysis, either using traditional processes or a SoSA methodology. Since the format of the SOD conceptual model is not directed, it can be modified to suit the interests of the design team and planners. Furthermore, since the model is strategic and does not represent potential target sets (as SoSA does), the model is less complex and the consequences of missing data are less severe.

The first weakness of SOD is its use of an entirely new vocabulary. Planners often embrace the phrase "words matter" when talking about planning. While EBO has received significant criticism for its use of new and modified terminology, the language of EBO is much closer to traditional processes than SOD. SOD is a highly sophisticated concept, but the words used to describe the process are completely foreign to the joint community. Perhaps future experiments with the concept will result in recommendations for new terminology, but it is difficult to imagine terms such as "rival as rationale" becoming an ingrained part of the conventional joint vocabulary.

The second weakness of SOD is its limited applicability at various levels of war and planning. The emphasis of SOD is on problem setting and not problem solving. Thus, SOD is most appropriate at the JTF or combatant command level. Understanding problem causality at the theater and grand strategic levels is a prerequisite to developing an appropriate operational concept. If SOD's applicability is limited to the high operational or theater strategic level of war, this creates two problems for the planning community. First,

very few planners will be exposed to the concepts of SOD since its application will only be necessary at the JTF or higher level. Second, SOD is time consuming. Higher headquarters' time devoted to discourse and not the production of a warning order will limit the amount of time available for subordinate level planners to develop component or service plans.

The third weakness of SOD is the difficulty of integrating discourse into established United States military hierarchical culture. This culture is not generally amenable to argument, and lies in direct conflict with a fundamental tenet of SOD. According to Schmitt, "faced with a wicked, socially complex problem, the commander holds a conversation—but not a casual conversation. The commander holds a *rigorous*, structured discussion with a group of stakeholders. The discourse is an interactive learning session. It is an ongoing process of *inquiry and argumentation* that leverages the collective intelligence of the design group."[19] (emphasis added) While some commanders encourage the open exchange of ideas on the staff, adopting SOD would require institutionalizing this mindset which may be problematic at best. If done correctly, changing this mindset would allow planners more intellectual freedom to pursue innovative and creative solutions to problems. Finally, at the JTF or higher level, the stakeholders Schmitt references may include representatives from other government agencies. Arguments between departments may cause significant friction, especially when different agencies bring different agendas to the table.

THE WAY AHEAD: AN INTEGRATED APPROACH

In light of the analysis presented, the best way forward for the planning community is adopting a modified process that blends portions of SOD, EBO, and traditional processes.[20] This proposal seeks to fill the "design gap" from Figure 2 with SOD components to generate the operational concept. Once the operational concept is approved by the commander,

elements of traditional processes and EBO are combined to complete the planning process and transition to execution and assessment. The discussion of this proposal assumes that a planning group has received a warning order from above and has begun planning.

Using SOD to fill the design gap allows the modified process to span the spectrum from problem framing through problem solving, and mitigates the most significant weakness of traditional processes. SOD discourse and framing provide planners and the commander with heightened awareness of the strategic environment and the interests and interactions of all actors. Testing hypotheses regarding the nature of the problem gives participating stakeholders a feel for how the strategic and operational problems nest within this environment. This shared understanding is beneficial in multiple ways. The most obvious is ensuring that stakeholders are attempting to solve the same problem. This may include deciding whether or not a particular state actor's interests are served by intervening in a crisis. Unresolved differences in opinion about the nature of the problem may derail future COA development. A second benefit of a shared understanding is refining and bounding the problem at hand. Do the stakeholders envision achieving the desired end state in six weeks, six months, or six years? Resolving these issues focuses the development of the operational concept. This type of interaction between stakeholders facilitates the integration of all instruments of power and helps ensure that the use of the military instrument complements or supports the other instruments of power. Finally, framing the problem effectively should allow for the design of one best COA.

At this point in the process, the commander (who should be an active participant in the discourse) should coordinate discourse with the next echelon up the chain of command. This step is crucial to ensuring the commander's refined view of the situation nests within the

directives passed by higher authority. If it does not, two scenarios can occur. First, the higher authority may agree with the problem as framed and defended by the planning group and commander. If so, a revised warning order may be issued by the higher authority. Second, if the higher authority does not agree, the commander must work to resolve the conflicting views through discourse and coordinate the way forward. Options here range from minor edits to the group's problem definition to accepting the original direction as fact.

Once the operational concept is approved, the first step in the planning section of the proposed process is to fill in knowledge gaps via conventional mission analysis. The one significant deviation in this proposal is the methodology for analyzing the enemy's COGs. The proposed solution involves incorporating the strengths of conventional COG analysis and SoSA to develop strategic and operational COGs. Conducting conventional COG analysis informed by a discourse-driven understanding of the strategic environment alleviates the concern of using false inductive reasoning to determine a COG. Once the operational COG's critical capabilities (CCs), critical requirements (CRs), and critical vulnerabilities (CVs) are identified, conducting node-and-link analysis on them would achieve greater granularity on systemic interactions at the operational level.

From an effects perspective, this provides insight into potential positive intended, indirect cascading effects. It also provides warning of unintended direct and indirect effects that may compromise the ability to achieve the defined operational and strategic objectives. Throughout COA refinement, effects experts should use the results of mission analysis to begin completing the links from objectives, to effects, to actions, to tasks. The more holistic understanding of the environment achieved by incorporating the elements of SOD in the design phase informs the development of intended and unintended effects. Saving time in

the development of these effects affords planners more time to devote to developing measures of performance (MOPs), effectiveness (MOEs), and success indicators (SIs). This time is also valuable for a more thorough evaluation of second and third order effects, especially since identifying or predicting causal linkages beyond the third order is exceptionally difficult.[21]

Finally, this modified approach to planning should incorporate one last tenet of EBO, that planning, execution, and assessment are "inextricably linked."[22] Maintaining close links among operational planners, executors, and assessors allows for rapid operational adaptation to the effects of interaction with the enemy. Transition to execution should not divorce designers and planners from their plan. They may be able to provide the most relevant insight into changing conditions during execution due to their familiarity with the enemy and the plan. Maintaining this link also provides continuity should operations require transition to branch or sequel plans. When decision points are identified in execution, the strategic environment may have changed to the point that pre-planned branches or sequels have lost validity. In this case, the planning team may need to reframe the problem using SOD concepts, effectively starting the design and planning cycle over again.

CONCLUSION

Despite the rhetoric and intense intellectual debate, planning lessons learned from recent conflicts and some relatively new concepts are coming together at a perfect time. The joint operational planning community should capitalize on this opportunity to sort through this complex problem to determine the most effective and efficient planning process for the future. This paper suggested ways to improve this process; they are an amalgamation of the best practices of three processes, which have been separated more by argument and choice

than by reality and necessity. This proposal is not structured as a checklist by design. Significant joint experimentation is required to add more substantive detail to the framework suggested. Each service should be an active participant in this experimentation since each has a vested interest in the future of the joint planning process. If a new or modified process is not joint at conception, attempts to make it joint can be painful, as recent experience with EBO demonstrates.

Solving this planning quandary promises to bear fruit beyond the DoD as well. Today's emphasis on interagency coordination requires DoD, at a minimum, to speak a common language. It is unrealistic and overly defense-centric to expect other Executive Branch agencies to learn five different and discrete military service languages. DoD planners critical of the processes embraced by other agencies must first satisfy the spirit of Goldwater-Nichols as well as the letter of the law. Adopting and executing a true joint planning process across the operational domain is a must. While the recommendations of this paper are focused solely on DoD, adopting this proposal after additional scrutiny and debate will lend the department more credibility during the interagency coordination process.

APPENDIX A

Traditional Processes

The "traditional processes" discussed in this paper are essentially a family of planning processes. This family is comprised of each service's discrete version of the planning process as well as the Joint Operational Planning Process. While each process is distinct from the others in limited ways, all share a relatively common path for arriving at the solution to a problem. Once a mission has been received from higher headquarters, each of these processes (joint and service specific) plans via a six or seven-step process which typically includes Mission Analysis, Course of Action (COA) Development, COA Analysis (Wargaming), COA Comparison and Decision, Plans and Orders Development, and Transition or Execution. See Joint Publication 5-0, *Joint Operation Planning*, for further information on the Joint Operational Planning Process, and each service's unique doctrinal publications for more detail on service-specific planning doctrine.

Traditional planning processes such as the U.S. Army's Military Decision Making Process and the U.S. Navy's Naval Planning Process have been the backbone of U.S. military planning for over a century. The U.S. Navy began to formalize the planning process as early as 1910 through the "Estimate of the Situation."[23] Formal U.S. Army staff planning matured later, with the July 1950 and November 1954 editions of FM 101-5, *Staff Officers' Field Manual: Staff Organization and Procedures* beginning to resemble today's Military Decision Making Process.[24]

APPENDIX B

Effects-Based Operations (EBO)

According to AFDD 2, "an effects-based approach to military operations means taking action against enemy systems so as to create specific effects that contribute directly to desired military and political outcomes."[25] EBO came into its own in the decade following Operation DESERT STORM. Although initially pushed primarily by the U.S. Air Force, in recent years USJFCOM has attempted to bring EBO into the joint realm.

At the most basic level, EBO attempts to ensure that not only does a fighting force "do things right," it also "does the right things." By examining adversary and friendly forces as dynamic, holistic systems, EBO is particularly concerned with the interaction of forces within a system, and exploiting those systems to compel the enemy to behave in the manner we want him to. Generating direct and indirect effects against and within PMESII systems eventually allows for the accomplishment of objectives, which, according to AFDD 2, are a "special subset" of indirect effects.[26] In other words, tactical tasks accomplish actions which produce direct and indirect effects. Objectives must be decided first before describing the intended indirect effects within which the objectives will nest. Actions and tasks should only be decided after objectives and effects.[27]

The following passage from AFDD 2 defines effects and how thinking about effects contributes to the accomplishment of objectives and eventually the desired end state:

> "Effect" refers to the physical or behavioral state of a system that results from an action, a set of actions, or another effect. Effects are parts of a causal chain that consists of objectives, effects, actions, and the causal linkages that conceptually join them to each other. Actions produce specific direct effects, those effects produce other indirect effects, and this chain of cause and effect creates a mechanism through which objectives and ultimately the end state are achieved.[28]

APPENDIX C

Systemic Operational Design

> Definition: An application of systems theory to operational art. It is an attempt to rationalize complexity through systemic logic. SOD is a holistic approach that translates strategic direction and policy into operational level designs. SOD focuses upon the relationships between entities within a system to develop rationale for systemic behaviors that accounts for the logic of the system. SOD facilitates a cycle of design, plan, act, and learn. This is accomplished through seven discourses, leading to a holistic design of an operation that will facilitate planning.[29]

Systemic Operational Design (SOD) was created by retired Israeli Brigadier General Shimon Naveh of the Israeli Defense Force. The concept has gained traction within the Army and the Marine Corps, with the Army's Training and Doctrine Command (TRADOC) and the Marine Corps Warfighting Laboratory (MCWL) conducting experiments in implementing the concepts of SOD.[30] It is important to note that SOD or SOD-like elements are not yet included in any service or joint doctrine publications. In addition, it is reasonable to question the validity of both SOD and EBO in light of Israel's poor performance against Hezbollah in southern Lebanon in 2006. Insufficient data and analysis exist to determine how much blame can be placed on either process as a whole, and how much is attributable to poor execution or other factors. For insights into the Israel operational concept against Hezbollah, see Ron Tira's report *The Limitations of Standoff Firepower-Based Operations: On Standoff Warfare, Maneuver, and Decision*. In any case, the purpose of introducing SOD in this paper is to bring out elements of the process, not to evaluate the validity of the concept as a whole.

According to Schmitt, the Marine Corps' presentation of SOD identifies seven components that make it qualitatively different than planning processes in use today.[31] First, SOD attempts to formalize the differences between design and planning, the heart of which is

separating problem formulation from problem solving. Second, SOD acknowledges the complexity of problems commanders face, and offers an ambiguity coping strategy vice a minimization strategy. Third, problem formulation is an inherently iterative process that requires constant testing and reevaluation of hypotheses. Fourth, hypothesis formulation naturally results from problem stakeholder discourse (i.e., argument) about the nature of the problem. Fifth, design or idea decisions are intuitive versus analytical decisions. Intuition in SOD results from an iterative reasoning process and understanding, not necessarily from direct experience with the exact problem at hand. Sixth, since design is based on intuition, understanding the problem naturally yields one best solution, making multiple course of action generation unnecessary. As contrasted with conventional mission analysis, SOD focuses on problem formulation and hypothetical causality, not an analysis of what has happened. Seventh and finally, complex operational problems lead themselves to a systems-view of the world that attempts to fully acknowledge the complexity of interaction between friendly, neutral, and adversary systems.

Schmitt contends that while planning processes are thoroughly addressed in joint and service doctrine, the definitions and descriptions of operational design are inadequate.[32] For a more detailed explanation of SOD and its associated concepts, see Schmitt's paper, "A Systemic Concept for Operational Design."

NOTES

[1] According to Dr. Milan Vego of the Naval War College, one of the five principal components of design for a major operation is the operational idea, which is "a single operational idea or scheme from which subordinate tactical commanders draw tactical schemes for their subordinate force elements." According the NWP 5-01, referencing JP 5-0, "operational design provides the mental framework through which the commander visualizes the arrangement of force capabilities in terms of time, space, and purpose in order to accomplish a mission." According to AFDD 2, "statements of strategy for a particular conflict can be found in the commander's estimate of the situation and in the "mission" and "concept of operations" sections of an operations order (OPORD)." Verbiage confusion only adds to the fog of planning.
[2] John F. Schmitt, "A Systemic Concept for Operational Design," http://www.mcwl.quantico.usmc.mil/file_download.cfm?filesource=c:%5CMCWL_Files%5CC_P%5CSchmitt_Design_v1_0_with_Bibliography.pdf (accessed 11 March 2007): 6.
[3] Reference Schmitt's paper for an explanation of the characteristics of wicked problems. Schmitt, 9-12.
[4] U.S. Air Force, *Operations and Organization*, AFDD 2 (Washington, DC: Department of the Air Force, 27 June 2006), 97, http://www.e-publishing.af.mil/ (accessed 27 February 2007).
[5] Schmitt, 8.
[6] Ibid, 2.
[7] Christopher R. Paparone, "US Army Decisionmaking: Past, Present and Future," *Military Review* (July-August 2001), 45-53, http://www.au.af.mil/au/awc/awcgate/milreview/pap.pdf (accessed 24 April 2007): 52.
[8] David A. Deptula, "Effects-Based Operations," *Air & Space Power Journal*, (Spring 2006), http://www.airpower.maxwell.af.mil/airchronicles/apj/apj06/spr06/spr06.html (accessed 27 February 2007)
[9] Ibid.
[10] AFDD 2, 11.
[11] Milan N. Vego, "Effects-Based Operations: A Critique," *Joint Forces Quarterly,* Issue 41, 2nd quarter 2006, http://www.ndupress.ndu.edu/ (accessed 06 March 2007): 51-57.
[12] Tim Challans, "Emerging Doctrine and the Ethics of Warfare," (unpublished paper for the Joint Services Conference on Professional Ethics, Ft. Leavenworth, KS, 2005), www.usafa.af.mil/jscope/JSCOPE06/Challans06.html (accessed 6 March 2007).
[13] Chairman, U.S. Joint Chiefs of Staff, *Joint Operation Planning*, Joint Publication (JP) 5-0 (Washington, DC: CJCS, 26 December 2006), 15.
[14] AFDD 2, 14.
[15] Alexander Rosenburg, *The Philosophy of Social Science,* (Boulder: Westview Press, 1995), chapter 2, cited in Tim Challans, "Emerging Doctrine and the Ethics of Warfare," (accessed 6 March 2007).
[16] As the newest process of the three, very little information on verifiable strengths and weaknesses of SOD exists. Lessons learned from recent Army and Marine Corps experiments with SOD will provide more comprehensive insight of the concept's validity. Consequently, the analysis of strengths and weaknesses in this section is solely the result of the author's review of "A Systemic Concept for Operational Design" by Schmitt.
[17] Schmitt, 19.
[18] Ibid, 3.
[19] Ibid, 18.
[20] The idea to reexamine military planning processes is not new. In fact, in a 2006 School of Advanced Military Studies (SAMS) monograph, U.S. Army Major Ketti Davison promotes fusing SOD with the traditional MDMP process. This paper stops short of the detailed direction that Major Davison proposes, primarily due to the difficulties of language SOD brings to the table. Additionally, Major Davison does not promote incorporating elements of EBO into her revised structure. Discussions with other SAMS students at Theater Campaign Warfare 2007 (held at Maxwell AFB, AL) indicate that both the U.S. Army and Marine Corps are considering integrating elements of SOD and EBO into traditional planning processes. See Ketti C. Davison, "Systemic Operational Design (SOD): Gaining and Maintaining the Cognitive Initiative," (monograph, Ft. Leavenworth, KS: School of Advanced Military Studies (SAMS), 25 May 2006), http://handle.dtic.mil/100.2/ADA458361 (accessed 6 March 2007).
[21] AFDD 2, 89.
[22] Ibid, 14.

[23] Chief of Naval Operations, "Navy Planning," NWP 5-01, 1-2.
[24] Paparone, 46.
[25] AFDD 2, 85.
[26] Ibid, 89.
[27] Ibid, 89.
[28] Ibid, 85.
[29] William T. Sorrells et al., "Systemic Operational Design: An Introduction." (unpublished monograph, Ft. Leavenworth, KS: School of Advanced Military Studies (SAMS), 2005), quoted in Patrick E. McGlade, "Effects-Based Operations Versus Systemic Operational Design: Is There a Difference?" (graduate research paper, Wright Patterson AFB, OH: Air Force Institute of Technology, June 2006), http://handle.dtic.mil/100.2/ADA450123 (accessed 6 March 2007): 10-11.
[30] Schmitt, 48.
[31] Ibid, 3-4.
[32] Ibid, 2.

SELECTED BIBLIOGRAPHY

Beagle, Thomas W. "Effects-Based Targeting: Another Empty Promise?" Thesis, Maxwell AFB, Al.: School of Advanced Airpower Studies, June 2000. https://research.maxwell.af.mil/papers/ay2000/saas/beagle.pdf. (accessed 5 March 2007).

Berg, Paul D. "Effects Based Airpower and Space Power." *Air and Space Power Journal* 20, no. 1 (Spring 2006): 17. http://www.airpower.maxwell.af.mil/airchronicles/apj/apj06/spr06/spr06.pdf. (accessed 5 March 2007).

Bowman, Christopher W. "Operational Assessment: The Achilles Heel of Effects-Based Operations?" Research Paper, Newport, R,I,: Naval War College, 13 May 2002.

Carey, Steven D., and Robyn S. Read. "Five Propositions Regarding Effects-Based Operations." *Air and SpacePower Journal* 20, no. 1(Spring 2006): 63-74. http://www.airpower.maxwell.af.mil/airchronicles/apj/apj06/spr06/spr06.pdf. (accessed 5 March 2007).

Challans, Tim. "Emerging Doctrine and the Ethics of Warfare." Unpublished paper for the Joint Services Conference on Professional Ethics, Ft. Leavenworth, KS, 2005. www.usafa.af.mil/jscope/JSCOPE06/ Challans06.html (accessed 6 March 2007).

Corbett, Art. "Why Say No to EBO?" Quantico, Va: Marine Corps Combat Development Command, 3 November 2002.

Davison, Ketti C., *Systemic Operational Design (SOD): Gaining and Maintaining the Cognitive Initiative*. Monograph, Ft. Leavenworth, KS: School of Advanced Military Studies (SAMS), 25 May 2006. http://handle.dtic.mil/100.2/ADA458361 (accessed 6 March 2007).

Deptula, David A. "Effects-Based Operations." *Air and Space Power Journal* 20, no. 1 (Spring 2006): 4-6. http://www.airpower.maxwell.af.mil/airchronicles/apj/apj06/spr06/spr06.pdf. (accessed 5 March 2007).

Hunerwadel, J. P. "The Effects-Based Approach to Operations: Questions and Answers." *Air and Space Power Journal* 20, no. 1 (Spring 2006): 53-62. http://www.airpower.maxwell.af.mil/airchronicles/apj/apj06/spr06/spr06.pdf. (accessed 5 March 2007).

_____. "Overpromising and Underestimating: A Response to 'Five Propositions Regarding Effects-Based Operations.'" *Air and Space Power Journal* 20, no. 1 (Spring 2006): 75-79. http://www.airpower.maxwell.af.mil/airchronicles/apj/apj06/spr06/spr06.pdf. (accessed 5 March 2007).

Joint Warfighting Center. Joint Concept Development and Experimentation Directorate, Standing Joint Force Headquarters. *Commander's Handbook for an Effects-Based Approach to Joint Operations*. 24 February 2006.

McCrabb, Maris. "Explaining 'Effects': A Theory for an Effects-based Approach to Planning, Executing and Assessing Operations." Version 2.0, 7 August 2001. http://www.dtic.mil/jointvision/ideas_concepts/ebo.doc. (accessed 5 March 2007).

McGlade, Patrick E. "Effects-Based Operations Versus Systemic Operational Design: Is There a Difference?" Graduate research paper, Wright Patterson AFB, OH: Air Force Institute of Technology, June 2006. http://handle.dtic.mil/100.2/ADA450123. (accessed 6 March 2007).

Paparone, Christopher R. "US Army Decisionmaking: Past, Present and Future." *Military Review* (July-August 2001): 45-53. http://www.au.af.mil/au/awc/awcgate/milreview/pap.pdf (accessed 24 April 2007).

Rickerman, Leonard D. "Effects Based Operations: A New Way of Thinking and Fighting." SAMS Monograph, Fall 2002.

Riza, Shane. "The Operational and Tactical Nexus: Small Steps Toward Seamless Effects Based Operations." Research paper, Maxwell AFB, Al.: Air Command and Staff College, April 2005.

Schmitt, John F. "A Systemic Concept for Operational Design." Working Draft, v0.3. Concepts and Plans Division, Marine Corps Warfighting Laboratory, 22 June 2006. http://www.mcwl.usmc.mil/file_download.cfm?filesource=c:%5CMCWL_Files%5CC_P%5C schmitt_Design_v1_0_with_Bibliography[1].pdf. (accessed 5 March 2007).

Sorrells, William T., Glen Downing, Paul Blakesley, David Pendall, Jason Walk, Richard Wallwork. "Systemic Operational Design: An Introduction." Unpublished monograph. School of Advanced Military Studies, US Army Command and General Staff College. Fort Leavenworth KS, 2005.

Tira, Ron. *The Limitations of Standoff Firepower-Based Operations: On Standoff Warfare, Maneuver, and Decision*. Memorandum 89. Tel Aviv, Israel: Institute for National Security Studies, March 2007.

U.S. Air Force. *Operations and Organization*. Air Force Doctrine Document (AFDD) 2. Washington, D.C.: Department of the Air Force, 27 June 2006.

U.S. Army. *Operations*. Field Manual (FM) 3-0. Washington, D.C.: Department of the Army, June 2001.

U.S. Office of the Chairman of the Joint Chiefs of Staff. *DoD Dictionary of Military and Associated Terms*. Joint Publication (JP) 1-02, 8 August 2006. http://www.dtic.mil/doctrine/jel/doddict/index.html. (accessed 5 March 2007).

_____. *Joint Operations*. Joint Publication (JP) 3-0. Washington, DC: CJCS, 17 September 2006.

_____. *Joint Operation Planning*. Joint Publication (JP) 5-0. Washington, DC: CJCS, 26 December 2006.

U.S. Navy. Office of the Chief of Naval Operations. *Navy Planning*. Navy Warfare Publication (NWP) 5-01. Washington, DC: Department of the Navy, CNO, January 2007.

Van Riper, Paul K. *Planning for and Applying Military Force: An Examination of Terms*. Washington, DC: Hicks & Associates, 2005.

Vego, Milan N. "Effects-Based Operations: A Critique." *Joint Forces Quarterly* Issue 41 (2nd quarter 2006). http://www.ndupress.ndu.edu/ (accessed 06 March 2007): 51-57.

_____. *Operational Warfare*. Newport, RI: Naval War College, 2000.

Williams, Brett T. *Effects-Based Operations: Theory, Application, and Role of Airpower,* Carlisle, Pa.: US Army War College, 9 April 2002.